

Evolution of octupole correlations in Ba 123

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Abstract

©2016 American Physical Society. High-spin states of Ba123 have been studied via the Cd108(F19,3np)Ba123 fusion-evaporation reaction at a beam energy of 90 MeV. Several E1 transitions linking the positive-parity $\nu(d5/2+g7/2)$ band and negative-parity $\nu h11/2$ band are observed in Ba123 for the first time. Evidence for the existence of octupole correlations in Ba123 is presented based on the systematic comparisons of the $B(E1)/B(E2)$ branching ratios and the energy displacements in odd-A Ba isotopes. The characteristics of octupole correlation in the odd-ABa123,125 are explained by the state-of-the-art multidimensionally-constrained relativistic mean-field model and cluster model based on the dinuclear system concept.

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